



## **Knob Potentiometer**



### **DESIGN SUPPORT TOOLS**

click logo to get started



The P16 is a revolutionary concept in panel mounted potentiometers. This unique design consists of a knob driving and incorporating a cermet potentiometer. Only the mounting hardware and terminals are situated on the back side of the panel reducing to a minimum the required clearance.

QUICK REFERENCE DATA					
Multiple module	No				
Switch module	n/a				
Detent module	n/a				
Special electrical laws	A: linear, L: logarithmic, F: reverse logarithmic				
Sealing level	IP 67				
Lifespan	50K cycles				

#### **FEATURES**

• Test according to CECC 41000 or IEC 60393-1

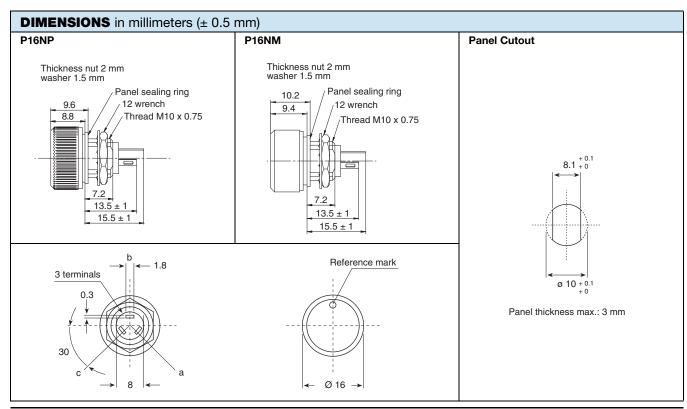


 P16 - version for professional and industrial applications (cermet)
 1 W at 40 °C

RoHS COMPLIANT

 PA16 - version for professional audio applications (conductive plastic)
 0.5 W at 40 °C

- Compact (integrated)
- High dielectric strength: 2500 V<sub>RMS</sub>
- Fully sealed and panel sealed
- Metallic or plastic knob options
- · Custom knob on request
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>





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ELECTRICAL SPECIFICATIONS				
	P16	PA16		
Resistive element	Cermet	Conductive plastic		
Electrical travel	270° ± 10°	270° ± 10°		
Power rating chart	0.25 PA16 LIN. TAPER PA16 LOG. TAPER 0 20 40 60	80 100 120 140 MPERATURE IN °C		
Circuit diagram	a (1) b 0 →	C (3)		
Taper	0 20 40	60 80 100 WISE SHAFT ROTATION		
Resistance range linear taper logarithmic taper		1 k $\Omega$ to 1 M $\Omega$ 470 $\Omega$ to 500 k $\Omega$		
Standard series E3	1 - 2.2 - 4.7 and on request 1 - 2 - 5	1 - 2.2 - 4.7		
Tolerance standard on request		± 20 % ± 10 % (1 kΩ to 100 kΩ)		
Power rating logarithmic	1 W at +40 °C	0.5 W at +40 °C 0.25 W at +40 °C		
Temperature coefficient (typical)	± 150 ppm/°C	± 500 ppm/°C		
Dielectric strength (RMS)	2500 V	2500 V		
Limiting element voltage (linear law)	350 V	350 V		
Contact resistance variation	3 % Rn or 3 Ω	2 % Rn or 3 Ω		
CONTROL TOSISTATION VARIATION		2 % Rn or 3 Ω 1 Ω		
End resistance (typical)	1 Ω	10		



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MECHANICAL SPECIFICATIONS				
Mechanical travel	300° ± 5°			
Operating torque	2 Ncm typical			
End stop torque	25 Ncm maximum			
Max. tightening torque of mounting nut	180 Ncm maximum			
Unit Weight	4.5 g typical			

ENVIRONMENTAL SPECIFICATIONS					
	METALLIC KNOB	PLASTIC KNOB			
Temperature range	-40 °C to +125 °C	-40 °C to +85 °C			
Climatic category	40/100/56	40/85/56			
Sealing	Sealed container and panel sealed				
Protection grades	IP67				

### **MARKING**

- · Ohmic value code, tolerance code and taper
- Manufacturing date code

#### **PACKAGING**

• Carton box of 20 pieces

P16 S	P16 STANDARD RESISTANCE ELEMENT DATA							
STAN-	LIN	EAR TAP	ER	LOG TAPER				
DARD RESIS- TANCE VALUES		MAX. VOLTAGE	MAX. CUR. THROUGH WIPER	MAX. POWER AT 40 °C	MAX. VOLTAGE	MAX. CUR. THROUGH WIPER		
Ω	W	٧	mA	W	V	mA		
22 47 100 220 470 1K 2.2K 4.7K 10K 22K 47K 100K 220K 470K 1M 2.2M 4.7M	1 1 1 1 1 1 1 1 1 0.56 0.26 0.12 0.05 0.02	4.69 6.85 10 14.8 21.7 31.6 46.9 68.5 100 148 217 316 350 350 350 350	213 146 100 67.4 46.1 31.6 21.3 14.6 10 6.74 4.61 3.16 1.59 0.75 0.35 0.16 0.07	0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	7.1 10.5 15.3 22.4 33.2 48.5 70.7 105 153 224 332 350 350	71 48 32.6 22.4 15.1 10.3 7.07 4.77 3.26 2.24 1.51 0.74 0.35 0.16		

### **CONTROL KNOB**

Black metallic knob (NM).

Black plastic knob (NP).

For white and blue color see ordering information. Other dimensions, shapes, colors of control knobs are manufactured on request - please consult Vishay.

Other reference marks (shapes, colors) and legends can be printed on plastic knob on request - please consult Vishay.

PA16	PA16 STANDARD RESISTANCE ELEMENT DATA							
STAN-	LI	LINEAR TAPER LOG TA			LOG TAP	ER		
DARD RESIS- TANCE VALUES	MAX. POWER AT 40 °C	MAX. VOLTAGE		MAX. POWER AT 40 °C	MAX. VOLTAGE	MAX. CUR. THROUGH WIPER		
Ω	W	V	mA	W	V	mA		
470 1K 2.2K 4.7K 10K 22K 47K 100K 220K 470K 1M	0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.26 0.12	22.4 33.2 48.5 70.7 105 153 224 332 350 350	22.4 15.1 10.3 7.07 4.77 3.26 2.24 1.51 0.74 0.35	0.25 0.25 0.25 0.25 0.25 0.25 0.25 0.25	10.8 15.8 23.5 34.3 50.0 74 108 158 235 343	23.1 16 11 7 5.0 3.4 2.3 1.6 1.1		



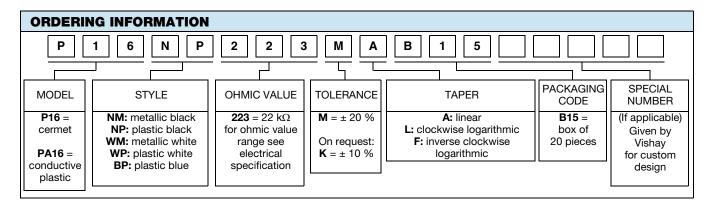
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PERFORMANCE						
TESTS	CONDITIONS	TYPICAL VALUES AND DRIFTS				
12313	CONDITIONS	∆R <sub>T</sub> /R <sub>T</sub> (%)	$\Delta R_{1-2}/R_{1-2}$ (%)	OTHER		
Electrical endurance	1000 h at rated power 90'/30' cycle at +40 °C	± 5 %	-	Insulation resistance: $> 10^4 \text{ M}\Omega$ Contact res. variation: $< 2 \% \text{ Rn}$		
Damp heat, steady state	56 days 40 °C, 93 % HR	± 2 %	± 1 %	Insulation resistance: $> 10^4 \text{ M}\Omega$		
Mechanical endurance	50 000 cycles	± 5 %	-	Contact res. variation: < 2 % Rn		
Shock	50 g's at 11 ms 3 successive shocks in 3 directions	± 0.2 %	± 0.5 %	-		
Vibration	10 Hz to 55 Hz 0.75 mm or 10 <i>g</i> 's during 6 h	± 0.2 %	-	$\Delta V_{1-2}/\Delta V_{1-3} \le \pm \ 0.5 \%$		

#### Note

· Nothing stated herein shall be construed as a guarantee of quality or durability



PART NUMBER DESCRIPTION (for information only)								
P16	P16 NP 22 kΩ 20 % A BO e3							
MODEL	STYLE	VALUE	TOLERANCE	TAPER	SPECIAL	PACKAGING	SPECIAL	LEAD (Pb)-FREE

RELATED DOCUMENTS	
APPLICATION NOTES	
Potentiometers and Trimmers	www.vishay.com/doc?51001
Guidelines for Vishay Sfernice Resistive and Inductive Components	www.vishay.com/doc?52029



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